**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (currently amended): A digital ~~Digital~~ signal processing (DSP) receiver for analyzing an optical signal~~, in particular in a terabit optical network,~~ comprising:

a receiver input for receiving the optical signal;~~,~~

a photo diode,

an analog-to-digital conversion (ADC) unit;~~,~~ and

a DSP processing unit;~~,~~

~~wherein~~that the DSP receiver comprises a splitting unit splitting the optical signal received by the receiver input; ~~,~~and

at least two waveguide branches,

wherein ~~feeding~~ the split parts of the optical signal are fed into said at least two waveguide branches,

wherein ~~that~~ at least one waveguide branch comprises an optical filtering element,

wherein ~~that~~ each waveguide branch is fed onto a separate photo diode, ~~that~~

wherein the signal of each photo diode is fed into a separate ADC unit, ~~and that~~

wherein the signal of each ADC unit is fed into the DSP processing unit, and

wherein different types of filtering process are executed in each waveguide branch or one waveguide branch does not have the optical filter element and the other one of the at least two waveguide branches comprises the optical filter element.

2. (currently amended): The DSP receiver according to claim 1, wherein each waveguide branch comprises a different optical filtering element.

3. (currently amended): The DSP receiver according to claim 1, wherein the optical filtering element(s) comprise at least one of chromatic dispersion elements, ~~and/or~~ polarization filters, and/~~or~~ spectral filters.

4. (currently amended): The DSP receiver according to claim 1, wherein the DSP processing unit comprises at least one of an application specific integrated circuit ~~and/or~~ and a field programmable gate array circuit.

5. (currently amended): The DSP receiver according to claim 1, wherein an additional optical filtering element is arranged between the receiver input and the splitting unit.

6. (currently amended): A ~~Method~~ method for recovering an optical signal with a ~~DSP~~ digital signal processing receiver, the method comprising: ~~according to claim 1, wherein by the following steps:~~

~~a)~~ splitting the optical signal ~~is split~~ into parts and providing the signal parts to a respective branch of at least two branches;

~~b)~~ filtering at least one split optical signal ~~undergoes a filtering procedure~~;

~~c)~~ detecting and converting the split optical signals ~~are detected and converted~~ into split digital signals; and

~~d)~~ analyzing the split digital signals ~~are analyzed~~ in order to recover information of the optical signal,

wherein different types of filtering process are executed in each waveguide branch or one waveguide branch does not have the optical filter element and the other one of the at least two waveguide branches comprises the optical filter element.

7. (currently amended): The ~~Method~~ method according to claim 6, wherein the information is a recovered electrical data signal modulated onto the optical signal.

8. (currently amended): The ~~Method~~ method according to claim 6, wherein the information is likelihood numbers for the probability of 0 and 1 bits carried by the optical signal.

9. (currently amended): The ~~Method~~ method according to claim 8, wherein the analysis of the split optical signals uses a MAP algorithm.

10. (currently amended): A computer readable medium storing a ~~Software~~ program for performing ~~the~~ a method ~~according to claim 6~~ of recovering an optical signal with a digital signal processing receiver, the method comprising:

splitting the optical signal into parts and providing the signal parts to a respective branch of at least two branches;

filtering at least one split optical signal;

detecting and converting the split optical signals into split digital signals; and

analyzing the split digital signals in order to recover information of the optical signal,

wherein different types of filtering process are executed in each waveguide branch or one waveguide branch does not have the optical filter element and the other one of the at least two waveguide branches comprises the optical filter element.

11. (new): The DSP receiver according to claim 1, wherein:

the at least two waveguide branches comprise a first waveguide branch and a second waveguide branch,

the split parts of the optical signal comprises a first split part transmitted in the first waveguide branch and a second split part transmitted in the second waveguide branch,

the first waveguide branch does not have the optical filtering element and the DSP processing unit analyzes the first split part for intensity information of the whole optical signal, and

the second waveguide branch comprises the optical filtering element and the DSP processing unit analyzes the second split part for information specific to only the second split part of the optical signal.

12. (new): The DSP receiver according to claim 1, wherein:

the at least two waveguide branches comprise a first waveguide branch and a second waveguide branch,

the split parts of the optical signal comprises a first split part transmitted in the first waveguide branch and a second split part transmitted in the second waveguide branch,

the optical filtering element comprises a first type of filtering element and a second type of filtering element,

the first waveguide branch comprises the first type of filtering element,

the second waveguide branch comprises the second type of filtering element,

wherein the first type of filtering element performs a filter processing different from the second type of filtering element.

13. (new): The DSP receiver according to claim 12, wherein the first type of filtering element and the second type of filtering element comprise at least two of: a chromatic dispersion element, a polarization filter, and a spectral filter.

14. (new): The DSP receiver according to claim 1, wherein the DSP receiver is provided in a terabit optical network.

15. (new): A digital signal processing (DSP) receiver for analyzing an optical signal comprising:

a receiver input which receives the optical signal;

a photo diode,

an analog-to-digital conversion (ADC) unit; and

a DSP processing unit;

a splitting unit which splits the optical signal received by the receiver input; and

at least two waveguide branches,

wherein the split parts of the optical signal are fed into said at least two waveguide branches,

wherein at least one waveguide branch comprises an optical filtering element,

wherein each waveguide branch is fed onto a separate photo diode,

wherein the signal of each photo diode is fed into a separate ADC unit,

wherein the signal of each ADC unit is fed into the DSP processing unit, and

wherein the DSP processing unit is configured to correlate information of all waveguide branches to determine one of most likely transmitted bit pattern of the optical signal and numbers for the probability of 0 and 1 in the transmitted bit pattern of the optical signal.

16. (new): The DSP receiver according to claim 15, wherein each waveguide branch comprises a different optical filtering element.

17. (new): The DSP receiver according to claim 15, wherein the optical filtering element(s) comprise at least one of chromatic dispersion elements, polarization filters, and spectral filters.

18. (new): The DSP receiver according to claim 15, wherein the DSP processing unit comprises at least one of an application specific integrated circuit and a field programmable gate array circuit.

19. (new): The DSP receiver according to claim 15, wherein an additional optical filtering element is arranged between the receiver input and the splitting unit.

20. (new): A method for recovering an optical signal with a digital signal processing receiver, the method comprising:

splitting the optical signal into parts and providing the signal parts to a respective branch of at least two branches;

filtering at least one split optical signal;

detecting and converting the split optical signals into split digital signals; and

analyzing the split digital signals in order to recover information of the optical signal,

wherein said analyzing comprises correlating information of all waveguide branches to determine one of most likely transmitted bit pattern of the optical signal and numbers for the probability of 0 and 1 in the transmitted bit pattern of the optical signal.